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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/CEMENT/2014-15 Date: 02.03.2015

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore Nort Taluk.
*NAME OF THE WORK	:	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	28.02.2015
PERIOD OF TESTING	:	28.02.2015 to 02.03.2015

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	140 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	475 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

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****

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Job No.: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/SAND-Gradation/2014-15 : 02.03.2015

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

*** Name of Work** : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 28.02.2015

Date of Testing : 02.03.2015

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	93.50	90-100	90-100	90-100	95-100
2.36	75.30	60-95	75-100	85-100	95-100
1.18	55.10	30-70	55-90	75-100	90-100
600 Micron	25.80	15-34	35-59	60-79	80-100
300 Micron	11.00	5-20	8-30	12-40	15-50
150 Micron	4.70	0-10	0-10	0-10	0-15

*Information is furnished by the Customer/Representative.

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/AGG/GR/2014-15 : 02.03.2015

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

*** Name of Work** : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (40mm)

Sample Received on : 28.02.2015

Date of Testing : 02.03.2015

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	98.40	95-100	85-100
20	33.60	30-70	0-20
10	12.70	10-35	0-5
4.75	3.00	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/AGG/GR/2014-15 : 02.03.2015

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

*** Name of Work** : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (20mm)

Sample Received on : 28.02.2015

Date of Testing : 02.03.2015

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	96.30	95-100	85-100
10	31.18	25-55	0-20
4.75	4.68	0-10	0-5

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.09/BBU /STEEL/2014-15 09.03.2015

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore Nort Taluk.
Name of the Work	:	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Date of Test	:	09.03.2015
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	10	0.62	513	556	13.25	O.K	O.K

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Job No.: CTCE/BBMP/W.No.09/BBU /STEEL/2014-15 09.03.2015

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore Nort Taluk.
Name of the Work	:	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Date of Test	:	09.03.2015
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	16	1.58	520	563	13.65	O.K	O.K

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Job No.: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/CUBE/2014-15 09.04.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

***Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

***Agency** : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

***Name of the work** : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

***Sample ID** : Culvert Deck Slab Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

***Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 09.04.2015

Sl.No.	*Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	12.03.2015	09.04.2015	8.257	501.7	22.30
2	12.03.2015	09.04.2015	8.362	518.9	23.06
3	12.03.2015	09.04.2015	8.175	486.3	21.61

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.09/BBU/WMM/Gradation/2014-15 09.03.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

Name of Work : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

Date of Testing : 09.03.2015

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	125	125	2.5	97.5	95-100
22.4	1485	1610	32.2	67.8	60-80
11.2	1120	2730	54.6	45.4	40-60
4.75	755	3485	69.7	30.3	25-40
2.36	545	4030	80.6	19.4	15-30
0.600	410	4440	88.8	11.2	8-22
0.075	325	4765	95.3	4.7	0-8

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Job No.: CTCE/BBMP/W.No.09/BBU/WMM/Gradation/2014-15

09.03.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore Nort Taluk.

Name of Work : Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015

Date of Testing : 09.03.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	100	100	2.0	98.0	95-100
22.4	1525	1625	32.5	67.5	60-80
11.2	1240	2865	57.3	42.7	40-60
4.75	685	3550	71.0	29.0	25-40
2.36	545	4095	81.9	18.1	15-30
0.600	320	4415	88.3	11.7	8-22
0.075	475	4890	97.8	2.2	0-8

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Job No.: CTCE/BBMP/W.No.09/BBU/WMM/AIV/2014-15 09.03.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of the Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	09.03.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	296	
4	Aggregate Impact value = percent fines	21.76	22.72	
	100* (W_2/W_1)%			22.24

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.09/BBU/WMM/S-T/2014-15 09.03.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	09.03.2015

Result : Flakiness Index = **11.45%**

Elongation Index = **13.99%**

Result : Combined Flakiness & Elongation index 25.44%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No: CTCE/BBMP/W.No.09/BBU/CSR-02/777o/SDBC(QB)/2014-15 10.04.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore Nort Taluk.
*NAME OF THE WORK	:	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	08.04.2015
PERIOD OF TESTING	:	10.04.2015

The results of the tests conducted on the bitumen sample using for Semi Dense Bituminous Concrete.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	91	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	45	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	290	Min. 220

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/AIV/2014-15 10.04.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of the Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	10.04.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	295	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.47	22.37	**21.92**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

Note:

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Shape_T/2014-15 10.04.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	10.04.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.53%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index **26.37%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

Note:

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Stripping/2014-15 13.04.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of the work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	13.04.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.30	96.70
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Sp_Wa/2014-15 13.04.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of the Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	13.04.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2015	2011	2013	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1261	1263	
4	Weight of saturated surface dry aggregate in air	W_3 g	2025	2026	2028	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	760	765	765	
6	Weight of oven dried aggregate	W_4 g	2009	2009	2010	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.643	2.626	2.627	2.632
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.700	2.686	2.691	2.692
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.85%	0.90%	0.85%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Bitumen/2014-15 13.04.2015

BITUMEN DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
NAME OF THE WORK	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
SAMPLE I/D	Roads at Sapthagiri Layout Ward No.09
DATE OF TESTING	13.04.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Bitumen/2014-15 13.04.2015

GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS : 2386 and IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
NAME OF THE WORK	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
SAMPLE I/D	Roads at Sapthagiri Layout Ward No.09
DATE OF TESTING	13.04.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.25	5.32	5.32	94.68	90-100
4.75	254.3	53.54	58.85	41.15	35-51
2.36	54.57	11.49	70.34	29.66	24-39
1.18	48.53	10.22	80.56	19.44	15-30
0.3	27.42	5.77	86.33	13.67	9-19
0.075	36.52	7.69	94.02	5.98	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	31.56	6.66	6.66	93.34	90-100
4.75	263.5	55.59	62.25	37.75	35-51
2.36	54.75	11.55	73.80	26.20	24-39
1.18	43.12	9.10	82.90	17.10	15-30
0.3	26.58	5.61	88.50	11.50	9-19
0.075	28.71	6.06	94.56	5.44	3-8

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/AGG/2014-15 13.04.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk.
Name of the Work	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	13.04.2015

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	325	6.3	6.25	93.75	90-100	
4.75	2845	54.7	60.96	39.04	35-51	
2.36	615	11.8	72.79	27.21	24-39	
1.18	470	9.0	81.83	18.17	15-30	
0.3	315	6.1	87.88	12.12	9-19	
0.075	315	6.1	93.94	6.06	3-8	

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	290	5.5	5.47	94.53	90-100	
4.75	2655	50.1	55.57	44.43	35-51	
2.36	630	11.9	67.45	32.55	24-39	
1.18	485	9.2	76.60	23.40	15-30	
0.3	440	8.3	84.91	15.09	9-19	
0.075	495	9.3	94.25	5.75	3-8	

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Job No.: CTCE/BBMP/W.No.09/BBU/SDBC/Stability/2014-15 13.04.2015

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore Nort Taluk.
Name of the Work	:	Improvements and Asphalting to Sapthagiri Layout roads in Ward No.09, Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	EE/BTP/BBMP/E-PMT/08(14240)WO/320/2014-15 Dated: 23.02.2015
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	13.04.2015

The results of the tests conducted on the Semi Dense bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	9.25	9.40	8.2 Kn (min)
2	Marshal flow, mm	3.20	3.75	2 – 4
3	Percent air voids in Mineral Aggregate	4.55	4.25	3 – 5
4	Voids in Compacted Mix	13.80	13.55	13 – 15
5	Percent Voids filled with Bitumen	67.55	68.35	65 - 78
6	Density, g/cc	2.26	2.27	--

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